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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/902,699	07/12/2001	Hiroshi Miura	211375US2	1573
22850	7590	02/09/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			AGUSTIN, PETER VINCENT	
			ART UNIT	PAPER NUMBER
			2652	

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/902,699	MIURA ET AL.	
	Examiner	Art Unit	
	Peter Vincent Agustin	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 22 October 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-12, 14 and 16-23 is/are rejected.
- 7) Claim(s) 13 and 15 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 July 2001 is/are: a) accepted or b) objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-3, 10-12 & 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1, lines 9-11 recites “means for applying at least two laser beams having different power levels to form said at least one recording mark, and for varying a power level of one of the at least two laser beams to form the plurality of recording mark units”, which limitation was not described in the specification. See Response to Arguments below.

Claims 10 & 22 have limitations that are similar to those of claim 1, and therefore rejected using the same rationale.

Claims 2, 3, 11 & 12 are dependent upon rejected base claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 10-12 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (US 5,144,615) (hereafter Kobayashi) in view of Kobayashi (JP 02096937) (hereafter Kobayashi₂).

In regard to claim 1, Kobayashi discloses an information recording apparatus (Figure 1) for recording multi-leveled information in a phase-change recording medium (20) by the application of a laser beam (11) thereto, comprising: means (Figure 2, element 104; column 2, line 61 thru column 3, line 13) for modifying a power level of said laser beam into two or more power levels so as to correspond to said multi-leveled information, and for setting a plurality of recording mark units (column 3, line 12: record spot) including therein at least one recording mark to be formed, based on said modified power levels, so as to correspond to said multi-leveled information. However, in regard to claim 1, Kobayashi does not disclose a means for applying at least two laser beams having different power levels to form said at least one recording mark, and for varying a power level of one of the at least two laser beams to form the plurality of recording mark units.

Kobayashi₂ discloses a means (see purpose and constitution) for applying at least two laser beams having different power levels to form at least one recording mark, and for varying a power level of one of the at least two laser beams to form a plurality of recording mark units. It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have added the means for applying at least two laser beams of Kobayashi₂ to the apparatus of Kobayashi, the motivation being to increase information recording density.

In regard to claim 2, Kobayashi discloses that each of said recording mark units has a power level that corresponds to the total area of said one or more recording marks included in each of said recording mark units (column 3, lines 4-13).

In regard to claim 3, Kobayashi discloses that each of said recording mark units includes one recording mark and has a track-direction length in a range of 0.5 to 1.0 times a beam diameter defined by $1/e^2$ (see Figure 7), and the area of said recording mark in each of said recording mark units is changed for recording said multi-leveled information (column 3, lines 4-13).

In regard to claims 10-12 & 22, these claims have limitations that are similar to those of claims 1-3; thus, they are rejected using the same rationale as applied against claims 1-3 above.

5. Claims 4, 6-8, 16 & 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Izumi et al. (US 5,598,392) or Horibe et al. (US 5,598,396).

In regard to claims 4 & 16, Kobayashi discloses an information reproducing apparatus/method (figure 1) for reproducing multi-leveled information recorded in a phase-change recording medium (20) in the form of recording marks by the application of a recording laser beam (11) thereto, by the application of a reproducing laser beam thereto, comprising: means (40) for detecting a mark edge of said recording marks; and means (40) for reproducing said recording marks based on reference clock signals.

In regard to claims 6 & 18, Kobayashi discloses an information recording and reproducing apparatus/method (figure 1) for recording multi-leveled information in a phase-change recording medium (20) by the application of a recording laser beam (11) thereto, reproducing multi-leveled information recorded in a phase-change recording medium by the

application of a reproducing laser beam thereto, comprising: means/step (figure 2, element 104; column 2, line 61 thru column 3, line 13) for modifying a power level of said recording laser beam into two or more power levels so as to correspond to said multi-leveled information, and setting a plurality of recording mark units (column 3, line 12: record spot) including therein at least one recording mark to be formed, based on said modified power levels, so as to correspond to said multi-leveled information, and means/step (40) for reproducing said recording marks based on reference clock signals.

Kobayashi shows in figure 3 a mark edge detector (401) and an intensity detector (402), but remains silent to whether a timing of detecting the mark edge of each of said recording marks and a timing of detecting the intensity of a reflection light from each of said recording marks are different.

Izumi et al. disclose an optical reproducing apparatus wherein a timing of detecting a leading edge is different from a timing of detecting a trailing edge (see figure 3), in order to provide appropriate timing regardless of phase differences between the leading edge synchronizing signal and the trailing edge synchronizing signal (see column 15, lines 47-56). It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have provided different timings for the mark edge detector and intensity detector of Kobayashi as suggested by Izumi et al., the motivation being to provide appropriate timing regardless of phase differences between the mark edge detector and the intensity detector.

Horibe et al. disclose an optical reproducing apparatus (figure 16) wherein a timing of detecting an edge (figure 17C; column 2, line 3) is different from a timing of detecting an intensity (figure 17D; column 2, lines 1-3). It would have been obvious to one of ordinary skill in

the art at the time of invention by the applicant to have provided different timings for the mark edge detector and intensity detector of Kobayashi as suggested by Horibe et al., the motivation being to optimize recording capacity (see column 1, lines 7-19).

In regard to claims 7 & 19, Kobayashi discloses that each of said recording mark units has a power level that corresponds to the total area of said one or more recording marks included in each of said recording mark units (column 3, lines 4-13).

In regard to claims 8 & 20, Kobayashi discloses that each of said recording mark units includes one recording mark and has a track-direction length in a range of 0.5 to 1.0 times a beam diameter defined by $1/e^2$ (see figure 7), and the area of said recording mark in each of said recording mark units is changed for recording said multi-leveled information (column 3, lines 4-13).

6. Claims 5, 9, 17 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi & Izumi et al. as applied to claims 4, 6, 16 & 18 above, and further in view of Nagaai (JP 60187933 A).

For a description of Kobayashi & Izumi et al., see the rejection above. However, neither reference discloses a reproducing laser beam having a smaller beam diameter than a beam diameter of a recording laser beam in terms of a beam diameter defined by $1/e^2$.

Nagaai (see last three lines of constitution) discloses a reproducing laser beam having a smaller beam diameter than a beam diameter of a recording laser beam. It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have used the reproducing laser beam having a smaller beam diameter than a beam diameter of a recording

laser beam of Nagaai for the apparatus/method of Kobayashi & Izumi et al., the motivation being to attain accurate reproduction.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Iwasaki et al. (US 5,761,179).

For a description of Kobayashi, see the rejection above. However, Kobayashi does not disclose that said power level of said laser beam is modified into three power levels, a recording power level, an erasing power level and a bias power level, with the respective power levels thereof being set in a decreasing order of said recording power level, said erasing power level, and said bias power level (said recording power level > said erasing power level > said bias power level).

Iwasaki et al. disclose a laser beam having a power level modified into three power levels (figure 7): a recording power level (Pw), an erasing power level (Pe) and a bias power level (Pr), with respective power levels being set in a decreasing order. It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have modified the laser beam of Kobayashi into the three power levels suggested by Iwasaki et al., the motivation being to improve the quality of recording marks and to set an optimal recording power (column 3, lines 26-32).

8. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Kasami et al. (US 6,312,780).

For a description of Kobayashi, see the rejection above. Furthermore, Kobayashi discloses that the recording layer (figure 4, element 23) of the phase-change recording medium comprises Sb and Te, and at least one element selected from the group consisting of Ag, In, Ge,

Ga, B, Si and Al (column 4, lines 47-50). However, Kobayashi does not disclose that the Sb/Te content ratio is 2 to 5 in terms of atomic %.

Kasami et al. disclose in figures 10 & 13 a recording layer having an Sb/Te content ratio of 2 to 5 in terms of atomic %. It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to provide the recording layer of Kobayashi with a material comprising of Sb and Te with an Sb/Te content ratio of 2 to 5 as suggested by Kasami et al., the motivation being to provide a phase-change recording medium with optimum characteristics (see column 12, lines 11-15).

Allowable Subject Matter

9. Claims 13 & 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. See previous Office Action for reasons for the indication of allowable subject matter.

Response to Arguments

10. Applicant's arguments filed October 22, 2004 have been fully considered but they are not persuasive.

11. In regard to claims 1-3, 10-12 & 22, the Applicant submits (see page 10, paragraph 2) that the amendment to the claim is supported by the specification, for example, on page 21, line 6, to page 22, line 3. The examiner disagrees. The specification does not provide support for the claimed "at least two laser beams". The preamble of claim 1 clearly describes the application of a laser beam (emphasis added) to record information on a recording medium. The specification describes generating a laser beam, see for example, page 18, line 5. The claimed "different

power levels" is achieved by modifying a power level of the single laser beam into two or more power levels, as described on page 18, lines 5-7, and claim 1, lines 5. There is no disclosure or suggestion in the specification of applying "at least two laser beams having different power levels" to form recording marks. Furthermore, the claimed "recording mark units" have been described in the specification as being "set". The specification does not describe the recording mark units being "formed", as recited on the last line of claim 1. For at least these reasons, the specification does not provide support for the claimed "varying a power level of one of the at least two laser beams to form the plurality of recording mark units".

Furthermore, on page 10, paragraph 4 of the arguments, the applicant states the Figure 3 shows the laser beams Pw and Pe having different power levels. It should be noted that Pw and Pe are not laser beams. They are two different power levels of a single laser beam.

12. In regard to claims 4, 6, 16 & 18, the applicant traverses the rejection under 35 U.S.C. 103(a) because Izumi et al. do not teach or suggest a timing for detecting an intensity of a reflection light from each of the recording marks, and that timing being different than a timing for detecting an edge of a recording mark (see page 12, paragraph 1). It should be noted, however, that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, while Izumi et al. do not teach "a timing of detecting the mark edge" and "a timing of detecting the intensity of a reflection light" being different, Izumi et al. teaches different timings between detecting a leading edge and detecting a trailing edge, which teaching shows a clear

advantage and thus, provides motivation to modify the Kobayashi reference, as noted in the 103 rejection above.

13. In regard to claims 4, 6, 16 & 18, the applicant traverses the rejection under 35 U.S.C. 103(a) because Horibe et al. do not teach or suggest a timing for detecting a mark edge, a timing for detecting an intensity of a reflection light, and the two timings being different (see page 12, paragraph 2). The examiner disagrees. Figure 17C shows a timing of detecting an edge being different from Figure 17D, which shows a timing of detecting an intensity. Furthermore, the applicant points out that Horibe et al. describes the two signals being synchronized. Note that synchronization of these two signals keeps them “in phase”, but does not make them “different”, as clearly shown by the figures.

14. The applicant traverses the rejection of claims 5, 9, 14, 17, 21 & 23 because of alleged deficiencies of the applied references. However, the rejections are maintained in light of the Response to Arguments above.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Vincent Agustin whose telephone number is 703-305-8980. The examiner can normally be reached on Monday-Friday 9:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on 703-305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Peter Vincent Agustin
Art Unit 2652

WILLIAM KLIMOWICZ
PRIMARY EXAMINER